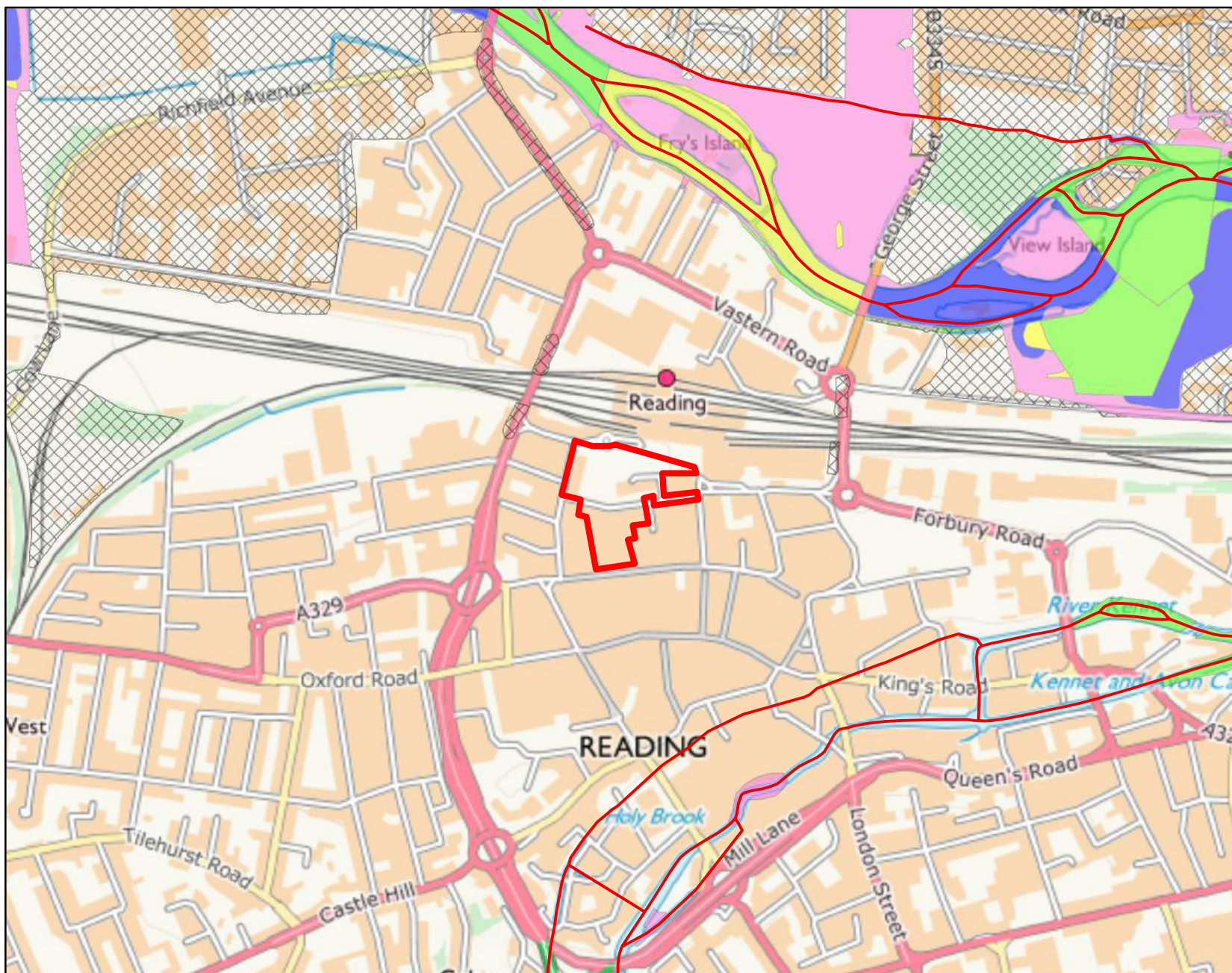
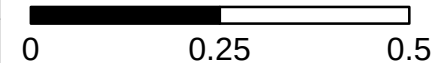


Historic flood map centred on site at Station Hill, Reading, RG1 1NR

Created on 30 November 2018 REF: THM106755_MM



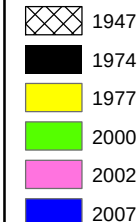
Kilometres



Legend

— Main River

year



Flooding from rivers or sea without defences (Flood Zone 3) shows the area that could be affected by flooding:

- from the sea with a 1 in 200 or greater chance of happening each year
- or from a river with a 1 in 100 or greater chance of happening each year.

The Extent of an extreme flood (Flood Zone 2) shows the extent of an extreme flood from rivers or the sea with up to a 1 in 1000 chance of occurring each year.

Historic flood data

THM106755_MM

Our records show that the area of your site has been affected by flooding.
Information on the floods that have affected your site is provided in the table below:

Flood Event Code	Flood Event Name	Start Date	End Date	Source of Flooding	Cause of Flooding
EA0619470300429	06MarchSpring1947	01/01/1947	12/12/1947	main river	channel capacity exceeded (no raised defences)
EA0619741100359	06NovemberAutumn1974	01/01/1974	12/12/1974	main river	channel capacity exceeded (no raised defences)
EA0619770800427	06AugustSummer1977	01/01/1977	12/12/1977	main river	channel capacity exceeded (no raised defences)
EA0620001201003	06DecemberWinter2000	01/01/2000	12/12/2000	main river	channel capacity exceeded (no raised defences)
EA0620030101899	06JanuaryNewYear2003	23/12/2002	12/01/2003	main river	channel capacity exceeded (no raised defences)
ea061231477	Shiplake CP_ Fluvial Water	19/07/2007	29/07/2007	main river	channel capacity exceeded (no raised defences)

Please note the Environment Agency maps flooding to land not individual properties. Floodplain extents are an indication of the geographical extent of a historic flood. They do not provide information regarding levels of individual properties, nor do they imply that a property has flooded internally.

Start and End Dates shown above may represent a wider range where the exact dates are not available.



C. Ramboll Drainage Strategy

Intended for
Lincoln MGT

Project No.
1620004716

Date
04 March 2019

Report Reference
SHR-RAM-XX-RP-C-000002

STATION HILL, READING PHASE 1 DRAINAGE STRATEGY AND SUDS REPORT REV.03

STATION HILL, READING

PHASE 1 DRAINAGE STRATEGY AND SUDS REPORT

REV.03

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Revision	Date	Prepared by	Checked by	Approved by	Description
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APPENDICES

Appendix 1

DRAINAGE STRATEGY PLAN

Appendix 2

FOUL WATER CALCULATIONS

Appendix 3

SURFACE WATER (MICRODRAINAGE) CALCULATIONS

Appendix 4

THAMES WATER ASSET PLAN

1. INTRODUCTION

1.1 Objective

The objective of this document is to provide a detailed description of foul and surface water drainage systems for Phase 1 of the proposed development at Station Hill, Reading RG1 1NF, Grid Reference (GR): N 471370, E 173710. Phase 1 (Plots E and F), comprising land between Friar Street (south) and Garrard Street (north), bisected by Friars Walk. The proposed Block E is situated to the west of Friars Walk, and Block F to the east.

This report is submitted in support of Condition 21 and references the proposed drainage strategy principles set out in the Flood Risk Assessment (Ref. CIV13174 ES 003) prepared by Waterman in March 2013. The report further references the revised surface water drainage strategy summarised in the Storm Water Drainage Strategy report prepared by Hoare Lea dated 13 July 2015.

The document is to be presented to key project stakeholders to confirm that they understand the current proposals and are in agreement that the philosophy will be adopted during future design phases. The document is prepared in support of the Planning Application, and thereon the development of the scheme.

1.2 Constraints and Limitations

This report has been prepared for exclusive use by Lincoln MGT for the purpose of explaining the proposed drainage strategy and associated constraints and opportunities that have been integrated within this development. The information presented in this report is based on the information outlined in the sections below.

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2. SITE INFORMATION

2.1 Records Review

The key reports and websites reviewed as part of this study are listed in Table 2.1, below.

Table 2.1 – Key Documents and Reports

Title	Author	Date
Site Topographical Survey	Plowman Craven	21 September 2018
Utility Search Report / Survey (Ref. PK/40652-001)	Plowman Craven	30 October 2018
Block E & F Layout Drawings	CallisonRTKL	27 November 2018
Flood Risk Assessment (Ref. CIV13174 ES 003)	Waterman	March 2013
Storm Water Drainage Strategy	Hoare Lea	13 July 2015
Contaminated Land Desk Study Document	Ramboll	October 2018
Party Wall Below Ground Drainage Report (Ref. 1620004716-SHR-RAM-RP-C-000001)	Ramboll	28 February 2019

2.2 Consultation

Following initial discussion with Thames Water, a pre-planning application was submitted outlining the principles of the proposed drainage strategy. At the time of writing a response to the submitted pre-planning application is pending. However, Thames Water indicated that the outfall connections proposed appear satisfactory, subject to further assessment by Thames Water on receipt of the detailed design information at the following design stage.

The Lead Local Flood Authority, Reading Borough Council, has been contacted to obtain their comment on the proposed drainage strategy. The Lead Local Flood Authority has stated in email correspondence dated 12 February 2019 that they have no objection in principle to the proposal considering an allowance of 40% for climate change and the pre-development rates previously agreed.

An existing services survey was undertaken by Plowman Craven in October 2018. A separate report has been prepared by Ramboll assessing the impact of the proposed development on existing services in the site boundary, and adjacent to the development site. Further discussions are required with statutory utility companies assess the existing services strategy, i.e. water, gas and electrical system. This assessment to be undertaken by others.

Where identified in the existing foul and surface water report prepared by Ramboll, existing services, identified as relevant, are to be maintained live for the duration of the proposed works and following completion. Several existing drainage connections from the adjacent site has been identified to be included in the proposed surface and foul water drainage strategy.

It is proposed to develop a foul and surface water drainage strategy utilising Thames Water manholes in Garrard Street, Friar Street and Merchants Place. New connections are proposed to the existing large diameter Thames Water foul water sewer to the north of Garrard Street, and a new connection to the existing Thames Water surface water sewer in Garrard Street.

It is assumed that the foul water drainage will outfall unattenuated to the aforementioned Thames Water infrastructure. Surface water flows will be attenuated to pre-development discharge rates previously agreed with Thames Water as outlined in the Storm Water Drainage Strategy report prepared by Hoare Lea, dated 13 July 2015, appended to this report for information.

2.3 Site Topography and Geology

The brownfield site that forms Phase 1 of the proposed development is located to the south of Station Hill, Reading, and comprises the disused Telecoms House and the Friars Walk Shopping Centre, currently used as a Zombie experience setting, and several small retail outlets.

The overall site area for Phase 1 and Phase 2 is circa 2.56 ha. However, for the purpose of this Drainage Strategy report, only the Phase 1 development site including an area of 0.9 ha is considered.

The topography of the site generally ranges in levels from circa 39.0m AOD in Garrard Street to the north, and circa 45.7m AOD in Friar Street to the south. Site levels fall toward the northwest of the site.

Figure 2.1 – Site Extents of Phase 1



Extract from CRTKL drawing SHR-CRL-SB-00-DR-A-113-103-9

2.4 Surface Waters

The River Thames and river Kennet are located in close proximity to the site, with the Thames approximately 420m to the northwest and the Kennett approximately 500m southeast of the development site.

The Environment Agency (EA) website has been interrogated to determine the hydrogeology of the area. The EA classifies the Alluvium and Taplow Gravel Formation as Secondary A aquifers and the Upper Chalk formation as a Principle Aquifer.

The EA¹ defines these as follows;

Principal Aquifer: *layers of bedrock or drift deposits with high intergranular and/or fracture permeability able to provide a high level of water storage. These aquifers may support water supply and/or river base flow on a strategic scale.*

Secondary A Aquifer: *permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.*

Although the site is not located within a Source Protection Zone, 12 groundwater extraction sites were recorded within a 1km radius of the development site. The closest borehole is 0.16km southwest of the development, and is understood to be used as drinking and washing water.

2.5 Ground Conditions and Groundwater

The geology of the site comprises superficial deposits of Alluvium and Taplow Gravel Formation, underlain by the Upper Chalk Formation. The upper layers of the Upper Chalk Formation comprise variable and significant thicknesses of Structureless Chalk.

Shallow groundwater was found within the Alluvium, Taplow Gravel Formation and Upper Chalk Formation, at depths between 2.7m bgl and 5.3m bgl, usually at or near the boundary of the Alluvium and Taplow Gravel Formation, or within the Structureless Chalk when the other forms of geology were absent.

The storm water attenuation tanks serving the proposed site will be located above the ground water table and is not expected to increase the risk of ground water flooding. The proposed invert level of the lowest attenuation tank proposed to the north of Phase 1 of the development is 37.7m AOD. From ground water monitoring the ground water levels encountered were between 2.15m bgl and 2.75m bgl, corresponding to 36.07m AOD and 36.44m AOD. Isolated perched groundwater bodies may also be present within parts of the Made Ground or Fill.

As advised in Sustainable Design and Construction Supplementary Planning Guidance, where the ground water is close to the surface, special considerations must be given when designing drainage systems such as inclusions of SuDS, soft landscaping as well as provision of adequate drainage. These parameters were all taken into consideration and implemented in the drainage strategy.

¹ From Environment Agency website, accessed 06 December 2018